

WHAT IS CLAIMED IS

1. A method of forming a gate electrode in a semiconductor device, comprising the steps of:

5 forming a gate oxide on a semiconductor substrate, depositing a polysilicon on the gate oxide;

forming a mask thin film on the polysilicon;

10 patterning the mask thin film using a photolithography process twice, wherein one photolithography process is performed with a mask pattern which masks neighboring gate electrode areas and an area between the neighboring gate electrode areas, another photolithography process is performed with a mask pattern which exposes the area between the neighboring gate electrode areas;

15 etching the polysilicon using the mask thin film pattern; and

removing the mask thin film pattern on the polysilicon.

2. The method of claim 1, wherein the mask thin film is patterned by a photolithography process with a mask pattern which masks neighboring gate electrode areas and the area between the neighboring gate electrode areas, and then by a photolithography process with a mask pattern which exposes the area between the neighboring gate electrode areas.

20 3. The method of claim 1, wherein the mask film is patterned by a photolithography process with a mask pattern which exposes the area between the neighboring gate electrode areas, and then by a photolithography process with a mask pattern which masks neighboring gate electrode areas and the area between neighboring gate electrode areas.

25 4. The method of claim 1, wherein the mask thin film is made from material having a great difference in etching rate from the polysilicon.

5. The method of claim 4, wherein the mask thin film is silicon oxynitride or silicon nitride.

30 6. A method of forming a gate electrode in a semiconductor device, comprising the steps of:

forming a gate oxide on a silicon substrate, depositing a polysilicon to function as a gate electrode on the gate oxide, and then forming a mask thin film to be used as a curing mask when the gate electrode is etched later;

forming a first pattern of photoresist on the mask thin film, and then performing a

- first etching step of etching the mask thin film based on the first pattern of photoresist;
removing the first pattern of photoresist, forming a second pattern of photoresist
on a portion of the mask thin film remaining after the first etching step and the
polysilicon, and then performing a second etching step of etching the mask thin film
based on the second pattern of photoresist;
- 5 removing the second pattern of photoresist, and then etching the polysilicon
using the mask thin film partially remaining on the polysilicon; and
forming the gate electrode by removing the mask thin film remaining on the
polysilicon.
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7. The method of claim 6, wherein the mask thin film is made from material
having a great difference in etching rate from the polysilicon.
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8. The method of claim 1 or 7, wherein the mask thin film is silicon oxynitride or
silicon nitride deposited by a PECVD method.
9. The method of claim 6, wherein the etching of the mask thin film in the first
and second etching steps is performed until the polysilicon is exposed.
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10. The method of claim 6, wherein, in the step of forming the gate electrode,
the mask thin film is removed by using a wet etching.